

WHAT IS CLAIMED IS:

1. An integrated circuit test apparatus, comprising;
 - 5 at least one electrically conductive probe needle;
 - an optical scan mechanism;
 - 10 a holder adapted to receive a wafer while presenting a backside surface of the wafer to the optical scan mechanism and an opposing, frontside surface of the wafer to the probe needle; and
 - 15 a mechanism coupled to the holder for moving the wafer relative to the probe needle.
2. The integrated circuit test apparatus of claim 1, wherein the probe needle is electrically coupled between a test device and a bonding pad of an integrated circuit.
3. The integrated circuit test apparatus of claim 1, further comprising a probe card 20 having trace conductors extending between the test device and the probe needle.
4. The integrated circuit test apparatus of claim 1, wherein the mechanism is adapted for movement in three dimensions relative to the probe needle, to enable the probe needle to contact a bonding pad upon an integrated circuit.
- 25 5. The integrated circuit test apparatus of claim 1, wherein the holder is adapted to receive an outer perimeter of the wafer frontside surface by applying vacuum pressure thereto.

6. The integrated circuit test apparatus of claim 1, wherein the holder is adapted to receive an outer perimeter of the wafer frontside surface by tabs arranged intermittently around the outer perimeter.

5 7. The integrated circuit test apparatus of claim 1, wherein movement of the mechanism occurs in a step-and-repeat fashion only during the interim between when the frontside and backside surfaces are presented to the probe needle and optical scan mechanism, respectively.

10 8. The integrated circuit test apparatus of claim 1, wherein the optical scan mechanism is adapted to emit radiation upon the backside surface and detect photoemission from the backside surface.

15 9. The integrated circuit test apparatus of claim 8, wherein the photoemission from the backside surface indicates the amount and/or location of defects on or near the frontside surface.

10. A method for testing an integrated circuit, comprising:

20 contacting a frontside surface of the wafer by a probe needle residing beneath the wafer;

exposing a backside surface of the wafer to an optical scan mechanism residing above the wafer; and

25 moving the wafer relative to the probe needle and scan mechanism in a step-and-repeat fashion during an interim between said contacting and said exposing.

11. The method of claim 10, wherein said contacting and said exposing occur concurrent with one another.

12. The method of claim 10, wherein said moving occurs via a machine.

5

13. The method of claim 10, wherein said contacting comprises:

connecting a test device to a bonding pad upon the frontside surface; and

10 activating the test device to apply or receive electrical energy to or from the bonding pad.

14. The method of claim 10, wherein said moving comprises retaining an outer perimeter of the wafer to a moveable holder that moves relative the probe needle and the scan mechanism.

15. The method of claim 10, further comprising measuring radiation emanating from the frontside surface, through the backside surface, and upon the scan mechanism.

20 16. The method of claim 15, wherein said contacting comprises forwarding electrical stimuli into the probe needle.

17. The method of claim 16, wherein said measuring occurs concurrent with said forwarding of electrical stimuli.

25

18. A semiconductor wafer, comprising

a frontside surface configured to receive a probe needle; and

a backside surface configured to receive radiation and, when circuits contained upon the frontside surface receive electrical energy from the probe needle, the backside surface emits optical energy from the frontside surface depending on defects within or near the frontside surface; and

5

wherein the frontside and backside surfaces of the wafer are moved a pre-defined and consistent amount in the interim between when the frontside surface receives the probe needle and the backside surface receives and emits optical energy.

10

19. The wafer of claim 18, wherein the frontside surface is adapted to receive electrical stimuli from the probe needles for affecting optical energy emitted from the backside surface.

15

20. The wafer of claim 18, wherein the backside surface is translucent to optical energy displayed as light or dark areas transferred through the backside surface from the frontside surface.